



I HOPE:

MORE SWITCHING LESS ROUTING

APRIL 20th 1994 Interviewed  
Leased LINE.

"...A SENTENCE FROM YOU ..."

(Here I will write a sentence that defines your work or your thoughts.  
This can be taken from your writings. Or from the interview...)

The Unknown History of the Internet

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①/4

BRAZIL # 6

HONG KONG.

Name of the  
Tg.

Presenter: hi  
UETS

CHINA

HUALIN QIAN

NAME SURNAME - TITLE.

CHIEF SCIENTIST

CHINESE  
ACADEMY  
OF SCIENCES

9-4-2014

Interviewed on February, 2014 in

Born in [DATE] in [PLACE]

1940.12.20

SHANGHAI, CHINA

Studies and Brief CV

USTC

1965

E-mail address

Links related to you

WORK

1960~1965, study in University of Science and  
Technology of China

1965~1995. Institute of Computing Technology, ICT  
Chinese Academy of Sciences,

1995~2014 Computer Network Info. Center,  
Chinese Academy of Sciences (CAS).

E-mail address hlqian@enic.cn.

Links related to you

CNIC

Do you remember when you had your first contact with a computer?

Yes<sup>1</sup>

Quite early. The first was setup by Chinese Academy of Sciences  
VP of cas  
name  
level  
that a  
Vice MINISTER

NAME=103

1962

Vacuum tube.

USTC

There was another one. Punched tapes. Black tape

What was your first contact/experience with Internet or ARPANET?

(And When)

1980 Computer network.

First time I touched ARPANet in GEORGIA TECH,

1982 was 2 years sent by my government.

My govern and Frankfurt was selected to go  
to develop X.25 network with research institutes.

Setup and connect a few nodes with a machine.

When finished we brought few nodes to ICT and we put them  
in diff. building and with copper wire we connected  
few buildings.

<sup>1</sup> In that



1990 ASIA Games: first time for china to do international sports games. (2)/4  
I was working with my colleagues since 1985 to create the network to connect SITES (sports buildings) in BEIJING.

VOICE DATA FAX	→ In a PC to be a FAX machine.	automatically turn on and off when faxes arrived.	developing software for each sport. Some of it were imported from other countries.
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1989 World Bank loan project. Big amount 4.2M US\$ to support our network. A supercomputer center wasn't convenient to go to the room, so the bank suggested to create a LAN → MAN connecting facilities. Speed > 10 Mbps. We wrote the proposal, which won (1990). The gov. asked to setup a new institute, which had to be approved by gov.

We did our work by the expert group the

[SHINGAI UNIV.  
PEKING UNIV  
ICT] → Preparing the organization.

In 1992 we finished 2 UNIV campuses. And 20 institutes were connected with fiber ICT. (begin of 1993 we finished all).  
The world bank loan didn't support the international link but the SCRC center + MAN.

We had DECnet and X.25. The PTT had CHINAPAC. NO TCP/IP.  
We tried to

1992 INET in KOBE in JAPAN.

First to talk to Steve Goldstein (NSF net) they were connecting 18 regions. and his wife Steve (job) assigned the job to SPRINT I talked to him he told me he couldn't give me an answer.

★ Madame Hu, she was the VP of CAS and 18 months later we were connected in 1994.

1993 August INET in SFO. There was a workshop (I was selected) to support registration.

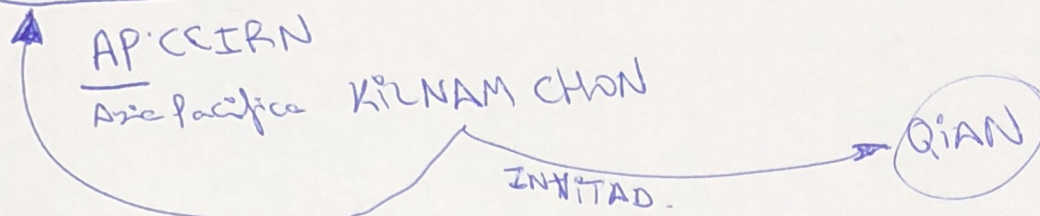
2003-2006, 5 days intense I met Dave Farber, Gerd and my network of internet engineers.  
BOARD MEMBER.



After 1993 INET ISOC meeting:

(3)/4

**CCIRN**: coordination comit for Inter Research Network.



RIGHT AFTER the INET

~~late~~ 1993 I was invited to participate to that meeting  
and ~~the~~ USSR and CHINA were allowed to connect to NSFNET.  
They asked (CCIRN) to NSF to allow us.

End of 1993 formally accepted.  
Then in March 1994 we connected through Sprint  
64Kbps link (satellite) BEIJING to SKY  
SKY to HAWAII.

The latency was several hundred milliseconds.

Madame Hu talked to many people.

1994 APRIL **NSF** + **CAS** had a meeting and officially agreed.

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In your opinion, what are the key characteristics of Internet?

It's OPEN!!! As the PC is open too we could do that. (add things).  
that's why is successful. If it's not, I don't think  
it went so well.

What do you consider the most important milestones in the development of the network?

• 19..

April 20 1994 • CONNECTION to The Internet  
May 21<sup>ST</sup> 1994. DEVELOPMENT/SETUP/BUILDING DNS Servers

Heart trouble  
1997  
PASSED AWAY  
ADMIN CONTACT

How did you contribute to the development of the Internet?

(How it contributed to the development of the Network?)

Connecting  
• In 1992 we wrote to INTERNIC, .CH was already registered by T.B. Qian  
and professor ZORN helped them to connect he relayed our email.  
• We talked to ZORN | CHINA Research Net | Registered but not used.  
to bring back the .CH | CHINA Academic Net |  
We prepared the DNS server up to | MAY 21<sup>ST</sup> 1994 | Was working with NOW BOTH CONTACTS.

Who are some key people in the development of Internet, leaders or trendsetters? Madame HU.

• To Dr Xing-Gang Wang, Yinglin Ma, Daoguan Hu.  
• To (together with me) engineering project.

Two anecdotal situations Relate here some unknown / underreported situations

1992/93 Theoretical physics - 3000 preprints papers. Our researchers reloaded.  
the Director of the institute complain to the PRESIDENT that they were isolated.  
Few days earlier an study was conducted, but presented by ISRAEL. they were publishing it.  
The CAS president

What do you think about the future of Internet?

(Two or three key aspects of the future).

If we shared our line there was a fine of 40% ADD in the price.  
30 times 40% Madame HU talked to the Vice Minister (they were some level) to remove that.

CHALLENGES < ARCHITECTURE  
SECURITY.

SECURITY: TOO MANY PARTS OF THE INET can be attacked. 500M modules (80% INET ENABLED)

no ideal now. You can't control the pass through.  
you can't report the Quality of Service (very difficult).

Do you see any technological trends?

More switching less routing.

The Key Issue is using SWITCHES  
but not ROUTING.  
Like MPLS (still needs routing).

## ADDITIONAL READING

PAPERS & BOOKS MENTIONED / RECOMMENDED

2008 In Chinese SWITCHING ARCHITECTURE, (Switching IP packets).  
instead of